

REMARKS/ARGUMENTS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1-9, 11-15, 17-20 and 22-29 are pending in the present application. Claims 1, 3, 6, 8, 11-14 and 17-19 are amended, Claims 10, 16 and 21 are canceled and new Claims 22-29 are added by the present amendment.

Applicants submit that claim amendments and new claims find support in the originally filed claims and the originally filed specification at least at page 36, line 2, to page 37, line 23. Thus, it is believed no new matter is added.

In the outstanding Office Action, the specification was objected to; the drawings were objected to; Claims 3 and 6-21 were rejected under 35 U.S.C. § 112, second paragraph; Claims 1, 2, 4-7, 9, 10, 17, 18, 20 and 21 were rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 5,827,632 to Inaba et al. (herein “Inaba”); Claims 1, 5, 6, 10, 17 and 21 were rejected under 35 U.S.C. § 102(b) as anticipated by European Patent No. 892 319 A1 (herein “EP ’319”); Claims 1-11 and 17-21 were rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 6,177,223 to Hashimoto in view of U.S. Patent No. 6,403,271 to Suzuki; Claims 12-16 were rejected under 35 U.S.C. § 102(e) as anticipated by U.S. Publication No. 2003/00118366 to Nukada; Claims 12, 13, 15 and 16 were rejected under 35 U.S.C. § 103(a) as unpatentable over Nukada in view or Inaba; and Claims 12-16 were rejected under 35 U.S.C. § 103(a) as unpatentable over Nukada in view of Hashimoto and Suzuki.

Regarding the objection to the specification and drawings, the specification and drawings are amended to incorporate suggestions in the outstanding Office Action. Accordingly, Applicants respectfully request those objections be withdrawn.

Further, regarding the rejection of Claims 3 and 6-21 under 35 U.S.C. § 112, second paragraph, Claims 3, 8, 14 and 18 are amended to more clearly recite that the inorganic particles are formed using a sol-gel technique, Claims 6, 12 and 17 are amended to replace “a further developer” with --a combination--, Claim 11 is amended to recite that the coloring agent includes a plurality of colors, and Claims 10, 16 and 21 are canceled, in light of comments in the outstanding Office Action.

In addition, Applicants respectfully traverse the assertion that the phrase “apparatus, comprising a developer,” in Claim 6 is indefinite. According to MPEP § 2171, the claims are evaluated to determine “whether the scope of the claim is clear to a hypothetical person possessing the ordinary level of skill in the pertinent art.” Applicants note that “a developer” is a positively recited element of the image forming apparatus of Claim 6, and that the specification provides an adequate description of the operation of the developer in the image forming apparatus. Therefore, Applicants respectfully submit that it would be clear to one of skill in the art that the developer is to be considered an element of the image forming apparatus.

Accordingly, Applicants respectfully request the rejection of claims under 35 U.S.C. § 112, second paragraph, be withdrawn.

Further, Applicants respectfully traverse the rejections under 35 U.S.C. § 102(b) of Claims 1, 2, 4-7, 9, 10, 17, 18, 20 and 21 as anticipated by Inaba and Claims 1, 5, 6, 10, 17 and 21 as anticipated by EP ‘319.

Amended Claim 1 is directed to a developer that includes, *inter alia*, a base toner containing a binding resin and a coloring agent, and inorganic fine particles. An average degree of roundness of the inorganic fine particles is greater than or equal to 0.98 and less than or equal to 0.996. Amended independent Claims 6, 12 and 17 include a similar feature.

Further, as recited in new dependent Claims 22-25, the degree of roundness is calculated as a peripheral length of a circle having an area equal to an area of an image of an inorganic fine particle divided by a peripheral length of the image of the inorganic fine particle.

Thus, a developer according to the claimed invention advantageously exhibits better characteristics, because, as discovered by the Applicants, if the average degree of roundness of the inorganic fine particles is below 0.98, fluidity of toner, supply property of toner, and preservation property of toner is reduced. Further, when the average degree of roundness of the inorganic fine particles is above 0.996, retaining the inorganic fine particles on the toner surface is more difficult, an affinity between the inorganic particles and the toner disadvantageously decreases, the inorganic fine particles are unable to function as external additives, and a storing property and a chargeability with respect to the environment deteriorates.¹

Further, a degree of roundness of the fine inorganic particles is advantageously determined based on a peripheral length of an image of the fine inorganic particles (for example, an electron microscope photograph), to avoid a possibility that the original shape of the fine inorganic particle may deform from deposition, for example platinum deposition.²

Applicants note that both Inaba and EP ‘319 are silent regarding any measure of a degree of roundness of inorganic fine particles with respect to the amended independent claims. Thus, neither Inaba nor EP ‘319 teach or suggest “an average degree of roundness greater than or equal to 0.98 and less than or equal to 0.996,” as recited in the independent Claims 1, 6, 12 and 17.

Hence, Applicants respectfully submit that independent Claims 1, 6, 12 and 17, and claims depending therefrom, patentably define over Inaba and EP ‘319.

¹ Specification at page 37, lines 11-22.

² Specification at page 36, lines 12-25.

In addition, Applicants respectfully traverse the rejection of Claims 1-11 and 17-21 as unpatentable over Hashimoto in view of Suzuki.

As noted in the outstanding Office Action, Hashimoto does not disclose the inorganic fine particles of the independent claims, and the Office Action relies on Suzuki to supply that feature.³ However, Suzuki only indicates that a spherical silica particle (e.g., inorganic fine particle) has “a spherical degree of 0.6 or more, and more preferably 0.8 or more.”⁴

According to MPEP § 2131.03,

[i]f the claims are directed to a narrow range, the reference teaches a broad range, and there is evidence of unexpected results within the claimed narrow range, depending on the other facts of the case, it may be reasonable to conclude that the narrow range is not disclosed [by the reference] with "sufficient specificity" to constitute an anticipation of the claims. The unexpected results may also render the claims unobvious.

Applicants respectfully submit that Suzuki is silent regarding any results associated with the spherical degree (e.g., degree of roundness). On the other hand, Applicants discovered unexpected advantages of insuring that a degree of roundness is constrained to greater than 0.98 and less than 0.996 as discussed above. In particular, fine inorganic particles having a degree of roundness less than the claimed range are disadvantaged in terms of fluidity of toner, supply property of toner, and preservation property of toner, while fine inorganic particles having a degree of roundness greater than the claimed range unexpectedly result in more difficult retention of the inorganic fine particles on the toner surface, a decreased affinity between the inorganic particles and the toner, an inability of the inorganic fine particles to function as external additives, and deteriorated storage and chargeability properties with respect to environmental conditions.⁵

Further, it is noted that Suzuki provides examples of eleven different external additives (e.g., fine inorganic particles), but each of the fine inorganic particles discussed by

³ Office Action at page 14, lines 9-12.

⁴ Suzuki at column 7, lines 55-57.

⁵ Specification at page 37, lines 11-22.

Suzuki has a degree of roundness equal to 0.95 or less. Thus, each of the fine inorganic particles presented by Suzuki is less than the claimed degree of roundness range (0.98 to 0.996, inclusive). Further, Suzuki's selection of fine inorganic particles all having a degree of roundness less than the claimed range is further evidence of the non-obviousness of that range and that the results of that range are unexpected.

Accordingly, Applicants respectfully submit that independent Claims 1, 6, 12 and 17, and claims depending therefrom, patentably define over the combined teachings of Hashimoto and Suzuki.

In addition, it is submitted that Hashimoto and Suzuki also do not teach or suggest the features of new Claims 22-25. As discussed above, Hashimoto is silent regard the claimed fine inorganic particles. Further, Suzuki indicates that a determination of the spherical degree (e.g., roundness of the fine inorganic particles) is based in part on a BET specific surface area measurement, which is different than "a peripheral length of the image of the inorganic fine particle," as recited in new Claims 22-25.

Thus, Applicants respectfully submit that Claims 22-25 also patentably define over Hashimoto and Suzuki.

Further, Applicants respectfully traverse the rejection of Claims 12-16 under 35 U.S.C. § 102(e) as anticipated by Nukada.

Independent Claim 12 is amended to more clearly and positively recite "a developer." Further, as noted in the outstanding Office Action, Nukada does not disclose the use of the claimed developer.⁶ Accordingly, it is respectfully submitted that independent Claim 12, and claims depending therefrom, patentably define over Nukada.

In addition, Applicants respectfully traverse the rejections of Claims 12, 13, 15 and 16 under 35 U.S.C. § 103(a) as unpatentable over Nukada in view of Inaba.

⁶ Office Action at page 16, last paragraph.

As discussed above, Claims 12-16 are believed to patentably define over Nukada.

Further, as discussed above, Inaba also does not teach or suggest the features of the independent Claim 12. Accordingly, it is respectfully requested those rejections be withdrawn.

In addition, Applicants respectfully traverse the rejections of Claims 12-16 under 35 U.S.C. § 103(a) as unpatentable over Nukada in view of Hashimoto and Suzuki.

As discussed above, Claims 12-16 are believed to patentably define over Nukada. Further, as discussed above, it is believed that Hashimoto and Suzuki also do not teach the features of independent Claim 12. Accordingly, it is respectfully requested that rejection also be withdrawn.

Accordingly, it is respectfully submitted that amended independent Claims 1, 6, 12 and 17, and claims depending therefrom, are allowable.

Consequently, in light of the above discussion and in view of the present amendment, the present application is believed to be in condition for allowance and an early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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IN THE DRAWINGS

The attached sheets of drawings include changes to Figs. 6, 7 and 8. These sheets, which include Figs. 6, 7 and 8, replace the original sheets including Figs. 6, 7 and 8.

Attachment: Replacement Sheet (2)